

Gas safety training exercises

National Grid Group Training Exercise #1

This training reflects industry best practices but does not replace your organization's SOPs/SOGs. This material can be utilized to provide a perspective as you reflect on emergency operations and can be collaboratively incorporated into your operating procedures as they are updated.

Training Officer:

Print pages 4 and 5 and hand them out to all participants so they can follow along for the discussion.

Gas Leaks

Gas main leak with no ignition

A contractor installing a water main at 5 South Street struck and ruptured a gas line during the excavation. The contractor dialed 911 and cleared 100 feet around the leak. Current weather is clear with a 12-mile-per-hour wind to the east. Your engine company and crew have been assigned to the incident. Your unit will be the first to arrive on the incident scene. As you initiate your response, your dispatch center reports receiving several 911 calls from nearby residents indicating a smell of gas in the area.

The area involved is a residential neighborhood and several residents are reporting that the smell of gas has entered their homes. Mrs. Norris, who lives at 15 South Street, dials 911 and reports the strong odor of gas in her basement.

As a crew, please work together to address the following response-related questions. Upon arrival, you encounter the situation displayed in the photo.



Training Officer Guidance | Questions and Answers

Relevant sections of the *National Grid Natural Gas Safety Training Certification Program* are listed below the answers where appropriate. Answers without a corresponding reference reflect fire service best practices or are derived from National Grid internal response protocols.

Initial response questions to consider

1. What instructions should be given to the callers who smell gas in the area?

The dispatcher should advise callers who can smell gas to evacuate their residences and the affected area (hot zone). They should be asked to report to the first arriving fire officer for additional evacuation instructions.

Please see Module 4, *Arriving on the scene, Evacuate occupants*

2. During response, how do you prepare yourself and your crew for the situation?

As your crew moves toward the incident scene, updates on the situation should be shared with all crew members and

the officer should assign personnel to tasks that he/she anticipates.

Please see Module 4, *Universal response tactics, Arriving on the scene, Parking, Evacuation*

3. How do you confirm that National Grid or the local natural gas utility has been notified of this event?

Upon arrival, the confirmation that National Grid or the local natural gas utility has been advised of the situation and is responding should be verified through the dispatch center after you have given your on-scene report.

Please see Module 4, *When to call, Arriving on the scene*

Questions as your crew arrives on the incident scene

1. Based on the image above, what is your size up of this situation?

Based on the debris cloud, a moderate pressure gas main has been ruptured with no ignition. Given the amount and velocity of the gas release, the area should be evacuated for 330 feet in all directions. Homes and confined spaces beyond that radius should also be checked with a combustible gas indicator (CGI). Residents should initially be evacuated to the cold zone and traffic should be rerouted. The incident commander may also wish to consider asking occupants of the cold zone to shelter in place, as this would minimize vehicular and pedestrian traffic that could complicate emergency operations.

In an effort to eliminate confusion, reduce the presence of ignition sources and maintain the safest possible environment to resolve the incident, occupants of the cold zone should be asked to close their windows, shut down ventilating equipment and shelter in place until the situation is resolved.

Please see Module 4, Arriving on the scene, Evacuate occupants

2. Using your knowledge of the characteristics of natural gas, describe where you think the gas will collect as it emerges from the street.

Although natural gas will rise and disperse in air, the velocity of this leak coupled with the path along underground structures provide the opportunity for the gas to spread into occupancies and confined spaces such as manholes and basements. Emphasis should be placed on checking basements of structures in, adjacent to and beyond the evacuation area.

Please see Module 2, Migration behavior, Module 4, Combustible gas indicator

3. How would you deploy your crew and other responding resources?

As you and your crew arrive on the incident scene, the following tactical priorities should be pursued:

- *Instruct the driver to stage apparatus across the road, upwind if possible, and at least 330 feet (as outlined by DOT ERG Guide 115) from the leak until the situation is evaluated.*
- *Extend a handline with a fog nozzle to provide operational flexibility and consider the need for a water supply if warranted by the situation.*
- *Work with responding police officers to evacuate the area.*
- *Assume command and develop a unified command structure with police personnel.*
- *Establish hot, warm and cold zones.*
- *Verify that people in the hot and warm zones have been evacuated.*
- *Initiate monitoring of the area with multiple CGIs.*

Please see Module 4, Universal response tactics, Arriving on the scene, Parking, Evacuation. Please see Module 4, When to call, Arriving on the scene

4. What should you NOT do as you address the situation?

There are three critical things that you must not do when responding to an outdoor natural gas leak. First, never extinguish burning gas. Second, never operate underground valves. Third, never open any type of gas valve that has been closed.

Please see Module 4, Universal response tactics, What NOT to do

5. What actions do you take prior to the arrival of National Grid personnel?

- *Approach cautiously. Following initial evaluation of the situation, stage apparatus upwind at a safe distance of 50 to 200 feet depending on the situation.*
- *Park out of the collapse zone if buildings are involved; park away from manhole covers and storm grates.*
- *Secure the area with caution tape and reroute traffic if necessary.*
- *Never enter a manhole, sewer or other type of underground vault.*
- *Eliminate potential sources of ignition such as idling vehicles or anything that could cause a spark. Use intrinsically safe radios and flashlights.*
- *If you must enter the hot zone, do so with the least amount of personnel necessary. All personnel entering the hot zone must have on full PPE and SCBA.*
- *Constantly monitor the atmosphere using multiple CGIs to identify the general area of the leak and migration of natural gas. Do not approach a leaking gas main. Utilize your CGI to check other areas, especially basements, for the presence of gas. Although natural gas will rise and disperse when not confined, leaks from gas infrastructure can easily and quickly migrate into enclosed spaces.*
- *Have a charged hand line with a fog nozzle ready to use in the event of a fire. This is a best practice that will increase your operational capability and safety on the incident scene. (The general rule is to never put out a gas fire. You may use a fog spray to direct vapors away from or cool combustible exposures and assist with rescue operations. A fog spray may also be utilized to extinguish fires not originating from the gas pipe. Do not use solid or straight stream nozzles on a gas leak.)*

Please see Module 2, Properties and characteristics of natural gas, Migration behavior. Please see Module 4, Universal response tactics

6. What impact could weather have upon this event?

Weather, especially temperature and wind direction, will impact the propagation of the vapor cloud. Although windy conditions will allow the vapor cloud to rapidly disperse it will also elongate your exclusionary zones. These factors should be considered when making decisions on evacuation, monitoring and deployment.

Please see Module 2, Properties and characteristics of natural gas, Migration behavior. Please see Module 4, Universal response tactics

Questions regarding working with National Grid

1. Upon the arrival of National Grid personnel, how do you integrate them into the command structure?

When it comes to controlling the leak, National Grid personnel are the experts and their efforts should be fully supported. Given the need to integrate operations, this is an opportunity to build relationships and form a unified command with National Grid personnel.

Please see Module 2, Working with us

2. What can you expect from National Grid?

National Grid personnel will respond to assist you, mitigate the leak, render the area safe and then restore service. In general, National Grid personnel will report presence to the incident commander (IC), coordinate action and work together to resolve the situation. Based on policy, National Grid personnel are responsible to do the following:

- Inform the IC of the arrival of National Grid Personnel and offer assistance. National Grid recognizes that an emergency incident is under the purview and control of the IC and will offer assistance.*
- Inquire if the gas source has been controlled, provide guidance as it relates to the gas distribution system and mobilize resources to control the leak.*

- Offer to work with the IC as a non-governmental organization (NGO) in the incident command system. Typically, this is referred to as developing a unified command.*
- Secure gas to the compromised gas infrastructure and work to eliminate ignition sources in proximity to the leak.*
- Upon request from the IC, work to detect combustible gas in structures that may have been impacted by the event.*
- Work with the fire department to ventilate structures, manholes, vaults and other sealed spaces or areas that have accumulated gas.*
- Coordinate with other utilities whose infrastructure has been impacted.*
- Shut off all services fed by the compromised gas infrastructure.*
- Provide public information to the media.*
- Restart gas service impacted by the event once the compromised infrastructure has been repaired and the isolated area has been pressurized.*

Please see Module 2, Working with us. Please see Module 4, Outdoor leak response, Evacuate occupants

Questions regarding evacuation

1. How do you determine the appropriate evacuation area?

Evacuate nearby occupants using the DOT Emergency Response Guidebook. Refer to guide 115 for minimum evacuation distances. For small leaks evacuate at least 330 feet in all directions. For larger leaks evacuate 1/2 mile in all directions. Consult with National Grid personnel to determine the most appropriate evacuation distances.

Please see Module 4, Outdoor leak response, Evacuate occupants

2. How do you implement the evacuation, and where are evacuees moved?

An evacuation is personnel-intensive and needs to be completed while other immediate priorities exist. If an evacuation is warranted, first call for additional resources and then coordinate your actions with other first responders.

Please see Module 4, Outdoor leak response, Evacuate occupants

Questions relative to the control and termination of the incident

1. How should you clear structures to verify that no hazard exists?

Teams of personnel with appropriate PPE should be assigned to clear specific structures or areas. The best composition of these teams is to have fire personnel work with National Grid personnel with CGIs. This enhances safety and multiplies capability, thus clearing the area in the least amount of time possible.

Please see Module 4, Outdoor leak response, Combustible gas indicator

2. How would you terminate this incident and whom do you turn the scene over to?

The incident would be terminated when the area is rendered safe and residents are allowed to return to their homes. The incident should be turned over to National Grid personnel who will continue to work at the scene and restore service.

Please see Module 4, Working with us



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2. During response, how do you prepare yourself and your crew for the situation?
3. How do you confirm that National Grid has been notified of this event?



